<u>IN THE CLAIMS</u>

Please cancel claims 1-4, 11-14 and 21-24, and amend claims 5-6, 15-16, and 25-26, as follows:

1-4. (CANCELED)

5. (CURRENTLY AMENDED) [[The]] <u>A</u> method of ~~claim 4~~ <u>optimizing execution of a</u> <u>query that accesses data stored on a data store connected to a computer,</u> <u>comprising:</u>

<u>generating cardinality estimates for one or more query execution plans for the query</u> <u>using statistics of one or more automatic summary tables that vertically overlap the query,</u> <u>wherein the statistics of the one or more automatic summary tables are used to improve a combined</u> <u>selectivity estimate of one or more predicates of the query, wherein the predicates are applied by</u> <u>one of the automatic summary tables, and</u> wherein the selectivity estimate comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query<u>;</u>

<u>using the generated cardinality estimates to determine an optimal query execution plan</u> <u>for the query; and</u>

<u>executing the optimal query execution plan for the query in order to access the data stored</u> <u>on the data store connected to a computer and then output the accessed data.</u>

6. (CURRENTLY AMENDED) [[The]] <u>A</u> method of ~~claim 3~~ <u>optimizing execution of a</u> <u>query that accesses data stored on a data store connected to a computer,</u> <u>comprising:</u>

<u>generating cardinality estimates for one or more query execution plans for the query</u> <u>using statistics of one or more automatic summary tables that vertically overlap the query,</u> <u>wherein the statistics of the one or more automatic summary tables are used to improve a combined</u> <u>selectivity estimate of one or more predicates of the query,</u> wherein zero or more predicates of the query are applied by one of the automatic summary tables<u>,</u> and wherein the remaining predicates are eligible to be applied on the automatic summary table<u>;</u>

<u>using the generated cardinality estimates to determine an optimal query execution plan</u> <u>for the query; and</u>

executing the optimal query execution plan for the query in order to access the data stored on the data store connected to a computer and then output the accessed data.

7. (ORIGINAL) The method of claim 6, wherein a predicate is eligible to be applied on the automatic summary table if it can be evaluated using the output columns and expressions of the automatic summary table.

8. (ORIGINAL) The method of claim 7, further comprising determining a subpredicate combined selectivity estimate of the unapplied eligible predicates using column distribution statistics of the automatic summary table.

9. (ORIGINAL) The method of claim 8, wherein a cardinality ratio comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query.

10. (ORIGINAL) The method of claim 9, wherein the selectivity estimate comprises a product of the subpredicate combined selectivity estimate and the cardinality ratio.

11-14. (CANCELED)

15. (CURRENTLY AMENDED) [[The]] An apparatus of claim 14 for optimizing execution of a query, comprising:
    a computer having a data store coupled thereto, wherein the data store stores data;
    one or more computer programs, performed by the computer, for:
        generating cardinality estimates for one or more query execution plans for the query using statistics of one or more automatic summary tables that vertically overlap the query, wherein the statistics of the one or more automatic summary tables are used to improve a combined selectivity estimate of one or more predicates of the query, wherein the predicates are applied by one of the automatic summary tables, and wherein the selectivity estimate comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query;

using the generated cardinality estimates to determine an optimal query execution plan for the query; and

executing the optimal query execution plan for the query in order to access the data stored on the data store connected to a computer and then output the accessed data.

16. (CURRENTLY AMENDED) [[The]] An apparatus ~~of claim 13~~ for optimizing execution of a query, comprising:

a computer having a data store coupled thereto, wherein the data store stores data;

one or more computer programs, performed by the computer, for:

generating cardinality estimates for one or more query execution plans for the query using statistics of one or more automatic summary tables that vertically overlap the query, wherein the statistics of the one or more automatic summary tables are used to improve a combined selectivity estimate of one or more predicates of the query, wherein zero or more predicates of the query are applied by one of the automatic summary tables, and wherein the remaining predicates are eligible to be applied on the automatic summary table;

using the generated cardinality estimates to determine an optimal query execution plan for the query; and

executing the optimal query execution plan for the query in order to access the data stored on the data store connected to a computer and then output the accessed data.

17. (ORIGINAL) The apparatus of claim 16, a predicate is eligible to be applied on the automatic summary table if it can be evaluated using the output columns and expressions of the automatic summary table.

18. (ORIGINAL) The apparatus of claim 17, further comprising determining a subpredicate combined selectivity estimate of the unapplied eligible predicates using column distribution statistics of the automatic summary table.

19. (ORIGINAL) The apparatus of claim 18, wherein a cardinality ratio comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query.

20. (ORIGINAL) The apparatus of claim 19, wherein the selectivity estimate comprises a product of the subpredicate combined selectivity estimate and the cardinality ratio.

21-24. (CANCELED)

25. (CURRENTLY AMENDED) [[The]] An article of manufacture of claim 24 comprising a non-transitory computer readable storage medium embodying one or more instructions executable by a computer to optimizing execution of a query that accesses data stored on a data store connected to the computer, comprising:

generating cardinality estimates for one or more query execution plans for the query using statistics of one or more automatic summary tables that vertically overlap the query, wherein the statistics of the one or more automatic summary tables are used to improve a combined selectivity estimate of one or more predicates of the query, wherein the predicates are applied by one of the automatic summary tables, and wherein the selectivity estimate comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query;

using the generated cardinality estimates to determine an optimal query execution plan for the query; and

executing the optimal query execution plan for the query in order to access the data stored on the data store connected to a computer and then output the accessed data.

26. (CURRENTLY AMENDED) [[The]] An article of manufacture of claim 23 comprising a non-transitory computer readable storage medium embodying one or more instructions executable by a computer to optimizing execution of a query that accesses data stored on a data store connected to the computer, comprising:

generating cardinality estimates for one or more query execution plans for the query using statistics of one or more automatic summary tables that vertically overlap the query, wherein the statistics of the one or more automatic summary tables are used to improve a combined selectivity estimate of one or more predicates of the query, wherein zero or more predicates of the

query are applied by one of the automatic summary tables, and wherein the remaining predicates are eligible to be applied on the automatic summary table;

using the generated cardinality estimates to determine an optimal query execution plan for the query; and

executing the optimal query execution plan for the query in order to access the data stored on the data store connected to a computer and then output the accessed data.

27. (ORIGINAL) The article of manufacture of claim 26, a predicate is eligible to be applied on the automatic summary table if it can be evaluated using the output columns and expressions of the automatic summary table.

28. (ORIGINAL) The article of manufacture of claim 27, further comprising determining a subpredicate combined selectivity estimate of the unapplied eligible predicates using column distribution statistics of the automatic summary table.

29. (ORIGINAL) The article of manufacture of claim 28, wherein a cardinality ratio comprises a ratio of a cardinality of the automatic summary table to a product of cardinalities of base tables referenced in the automatic summary table and the query.

30. (ORIGINAL) The article of manufacture of claim 29, wherein the selectivity estimate comprises a product of the subpredicate combined selectivity estimate and the cardinality ratio.